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<u>L41</u>	'5293163'.pn.	1	<u>L41</u>
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<u>L40</u>	l33 and (bitmap or bit with map or bit near map)	102	<u>L40</u>
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<u>L37</u>	'6282489'.pn.	1	<u>L37</u>
<u>L36</u>	'6282489'.pn.	1	<u>L36</u>
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<u>L35</u>	l6 and L34	39	<u>L35</u>
<u>L34</u>	l2 and l3 and L33	764	<u>L34</u>
<u>L33</u>	l1 and (map or atlas)	1319	<u>L33</u>
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<u>L31</u>	'5694534'.pn.	1	<u>L31</u>
<u>L30</u>	'5754846'.pn.	1	<u>L30</u>

<u>L29</u>	'5832406'.pn.	1	<u>L29</u>
<u>L28</u>	'5832406'.pn.	1	<u>L28</u>
<u>L27</u>	'5036471'.pn.	1	<u>L27</u>
<u>L26</u>	'5036471'.pn.	1	<u>L26</u>
<u>L25</u>	'5168452'.pn.	1	<u>L25</u>
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<u>L23</u>	'5170353'.pn.	1	<u>L23</u>
<u>L22</u>	'5170353'.pn.	1	<u>L22</u>
<u>L21</u>	'5285391'.pn.	1	<u>L21</u>
<u>L20</u>	'5285391'.pn.	1	<u>L20</u>
<u>L19</u>	'5406493'.pn.	1	<u>L19</u>
<u>L18</u>	'5406493'.pn.	1	<u>L18</u>
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<u>L16</u>	'5592665'.pn.	1	<u>L16</u>
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<u>L15</u>	L1 and (kd-tree or kd with tree or kd near tree or kd adj tree)	30	<u>L15</u>
<u>L14</u>	L2 and (kd-tree or kd with tree or kd near tree or kd adj tree)	29	<u>L14</u>
<u>L13</u>	L3 and (kd-tree or kd with tree or kd near tree or kd adj tree)	29	<u>L13</u>
<u>L12</u>	L4 and (kd-tree or kd with tree or kd near tree or kd adj tree)	29	<u>L12</u>
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<u>L8</u>	('5968109' '6184823' '6308177')[ABPN1,NRPN,PN,TBAN,WKU]	6	<u>L8</u>
<u>L7</u>	L6 and (kd-tree or kd with tree or kd near tree or kd adj tree)	6	<u>L7</u>
<u>L6</u>	L5 and (bitmap or bit-map or bit with map or bit near map or bit adj map)	39	<u>L6</u>
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<u>L3</u>	L2 and (parcels or sections or segments)	945	<u>L3</u>
<u>L2</u>	L1 and (features or characteristics)	1539	<u>L2</u>
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L24 and "ashby, richard".in.	17

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<u>L23</u>	L22 and (rectangle or rectangular or rectangul\$)	23	<u>L23</u>
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<u>L15</u>	340/991	696	<u>L15</u>
<u>L14</u>	340/990	2319	<u>L14</u>
<u>L13</u>	340.clas.	155748	<u>L13</u>
<u>L12</u>	701/209	1811	<u>L12</u>

L11 701/2002639 L11L10 701.clas.34855 L10L9 707.clas.30701 L9L8 707/2004122 L8L7 707/104.15028 L7*DB=USPT; PLUR=YES; OP=OR*L6 '4490717'.pn.1 L6L5 '4630209'.pn.1 L5L4 '4630209'.pn.1 L4

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5359527 | 4972319 | 4970652 | 5406493)! [PN]

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L23: Entry 20 of 23

File: USPT

Nov 16, 1999

DOCUMENT-IDENTIFIER: US 5987306 A

**** See image for Certificate of Correction ****

TITLE: System for monitoring telephone networks and/or data communication networks, especially mobile telephone networks

Brief Summary Text (24):

Further advantages and features of the present invention will become evident from the description below taken in conjunction with the attached drawings, and the patent claims attached.

Detailed Description Text (49):

It should be understood that all relevant data are stored in the said database management system DBMS, be it data relating to the configuration of the system components, set-up of measurement data, etc., as well as statistics about all mobile test units MTU and fixed test units FTU and also results from the network and the processed results therefrom, the system handling all data in a consistent manner, utilising the database management system as the preferred storage system which thus eliminates any intermediate formats visible to the user. The database management system is well structured, allowing the user to use pertaining information for applications different from those related to the set of tools associated with the actual network analysis of the cellular network. The open DBMS architecture also offers the user the option of combining the information in the DBMS with other external data sources and to establish links by means of common indices. The DBMS system may be chosen among most standardised database systems available in the market, in particular by using ODBC based technology.

Detailed Description Text (50):

The components mentioned as being part of the CeNA system communicate via standard communication networks based on TCP/IP, making a wide range of configuration solutions possible. The front end FE mentioned, the server CeNAS, fixed test units FTU and the presentation station PS may be geographically distributed and connected via the said network TCP/IP and the database management system DBMS. Because the said TCP/IP is supported by a large variety of base networks it is possible to interconnect components via LAN, WAN, fixed dial-up lines or ISDN. The communication between the mobile test units MTU and fixed test units FTU is implemented via a special modem.

Detailed Description Text (72):

With regard to definitions of areas, the CeNA system will typically work with sub-areas within a measurement area where measurings are performed. These are referred to as geographical areas, and this division is used in order that the operator may be able to carry out differentiated measurings within various sub-areas. For instance, certain problem areas may be given priority higher than where the mobile network functions without problems. The geographical areas are created randomly as polygons which will in turn be defined and named by the operator and also stored in the database management system DBMS for subsequent reference. The geographical areas are defined from the configuration station CS and may either interactively be defined via the GIS system, or be imported from external tables to the DBMS definitions. The geographical areas may also later on be used during presentations in restricting the result areas presented.

Detailed Description Text (74):

This will in actual fact entail a quantisation procedure, since an exact geographical position is being substituted by one or more parcels, comprising small rectangular regions, also referred to as a mesh, comprising the original. An exact point in time is substituted by one or several day periods spanning the original. Exact measurement data will, depending on the topic concerned, be substituted by accumulable quantities, comprising distribution, mean value,

median value as well as standard deviation. Each parcel will comprise its own set of these accumulators, making it possible to collect results from a multitude of measuring sessions, and then to regard these results as properties of individual locations rather than random arbitrary events taking place during individual conversations.

Detailed Description Text (75):

It is expedient that the parcels are grouped together in what is referred to as map sheets. In principle, a map sheet is a random rectangular region, subdivided into a grid, to form uniformly shaped parcels. In addition to its geographical boundaries and mesh size, a map sheet will also possess some few properties which determine whether or not it will be affected by incoming measurements forwarded to the collector. Among other things, this will include:

Detailed Description Text (177):

When the user/operator has an interesting set of maps, grids and chart overviews, the user will normally prepare a report. The report may be drawn up in many different ways, possibly using features related to Windows, as well as others by choosing in accordance with the presentation station of the system, PS.

CLAIMS:

1. A system for monitoring telephone networks and/or data communication networks, especially cellular mobile telephone networks, the system including a plurality of base stations equipped with a transmitter and a receiver as well as a plurality of mobile units with equipment for communicating with at least one of said plurality of base stations, the system comprising:

an operator of a network;

at least one fixed and/or mobile unit, said at least one fixed and/or mobile unit configured for making at least one observation of quality, and said at least one fixed and/or mobile unit configured for engaging in a communication with said operator, said communication between said at least one fixed and/or mobile unit and said operator occurring via said network;

a database wherein data relating to observations of quality from said at least one fixed and/or mobile unit are stored and processed;

a data processor, said data processor configured so as to be controllable by said operator;

wherein said database is accessed by said data processor to retrieve at least part of said data relating to observations of quality that have been received and stored, the accessing allowing an analysis of larger or smaller geographical areas, as well as smaller sub-areas and regions thereof, a geographical position being further definable by smaller mesh-shaped parcels; and

wherein the system further comprises a plurality of fixed and/or mobile units, said at least one fixed and/or mobile unit being one of said plurality of fixed and/or mobile units, said plurality of mobile units having quality observation organs that are equipped to make at least one measurement pertaining to at least one element of the group comprising a reception level, a reception quality, a signal to echo noise ratio, handovers, a time for establishing a connection, a rate of call set-up, blocked calls, failed calls, and failed handovers;

said quality observation organs also equipped for storing, updating, and transmitting said at least one measurement via said plurality of fixed units.

2. The system of claim 1, wherein said parcels are grouped together as map sheets that are subdivided by a grid.

16. The system of claim 1, wherein said database is an open database and said data relating to observations of quality is for analyzing and for graphical presentation of the quality of said network in selected geographical areas, for accumulating statistics, and for transporting of information to other applications.

18. A system for monitoring telephone networks and/or data communication networks, especially cellular mobile telephone networks, the system including a plurality of base stations equipped with a transmitter and a receiver as well as a plurality of mobile units with equipment for communicating with at least one of said plurality of base stations, the system comprising;

an operator of a network;

at least one fixed and/or mobile unit, said at least one fixed and/or mobile unit configured for making at least one observation of quality, and said at least one fixed and/or mobile unit configured for engaging in a communication with said operator, said communication between said at least one fixed and/or mobile unit and said operator occurring via said network;

a database wherein data relating to observations of quality from said at least one fixed and/or mobile unit are stored and processed;

a data processor, said data processor configured so as to be controllable by said operator;

wherein said database is accessed by said data processor to retrieve at least part of said data relating to observations of quality that have been received and stored, the accessing allowing an analysis of larger or smaller geographical areas, as well as smaller sub-areas and regions thereof, a geographical position being further definable by smaller mesh-shaped parcels;

wherein said observations of quality comprise quality observation measurements that are presented for visualized inspection in at least one form selected from the group comprising map sheets, either as statistical overviews of accumulated measurements or as a route overview for a mobile conversation: a grid overview; and a chart overview; and

wherein a presentation in the form of a route overview includes a built-up route list, said built-up route list comprising at least one element selected from the group comprising identification of a selected mobile unit with associated identification; time for starting and stopping; original cell and cellular network; available themes, including at least one of a reception level, a reception quality, and a time schedule; events that are to be part of the analysis, including at least one of completed or noncompleted handovers, establishment of a connection, blocked call, rejected call, and signal to echo noise ratio; and the presentation being shown in legible symbols.

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